

SECTION 10422
FIBERGLASS SIGNAGE

PART 1 - GENERAL

0.1 DESCRIPTION OF WORK

- A. Work Included: This Section specifies Fiberglass signage as indicated on the Drawings and specified herein:
1. System maps
 2. Neighborhood maps
 3. Line maps
 4. Mural Panels
 5. Directional Signage (includes but not limited to color ID bands & white directional bands).
- B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
1. Section 05500 - MISCELLANEOUS METALS; Frames and supports not integral with signage.
 2. Section 10420 - PORCELAIN SIGNAGE
 3. Section 10424 - SPECIALTY SIGNAGE
 4. Section 10426 - TACTILE/BRAILLE SIGNAGE
 5. Division 16 - ELECTRICAL; "Exit" signs
- C. Permits: Obtain permits required by Local Authorities for installation of signs.

0.2 SUBMITTALS

- A. Product Data: manufacturer's product data, any limitations and recommendations for each material used, installation instructions, and manufacturer's certification (stating that materials comply with requirements) for the MBTA Design Department review and approval.
- B. Shop Drawings: drawings for fabrication and installation of each sign type are for the MBTA Design Department review and approval. Drawings include mounting, layouts of sign wording, spacing, type size and style and plans, elevations, details of anchorage, connections and accessory items. Include installation templates for work installed by others.
- C. Sign Schedules: a complete sign schedule to include each sign type and quantities for the MBTA Design Department review and approval. Use same designation as on the Drawings.

- D. Samples and Proofs: Document MBTA Design Department's review and approval.
- E. Time Schedules and Required Proofs from the Fabricator to the MBTA Design Department:
 - 1. Paper Proofs: To be provided within 30 business days from the MBTA Design Department submittal of digital artwork. Fabricator provides one proof for each sign at 10% scale and one sign sample, determined by the MBTA, at 100% scale.
 - 2. Approval of all proofs is required from the MBTA Design Department prior to final signage production.
 - 3. Samples and proofs will be resubmitted until they meet quality standards outlined in the next section.
 - 4. Provide samples and proofs to the MBTA Design Department at no extra charge.

| <u>Sign Type</u> | <u>Description</u> |
|------------------|---|
| RTL | System Maps: 100% scale of 48" x 48" paper proof in full color to show image and color quality. |
| NM | Neighborhood Maps: 100% scale of 48" x 48" paper proof in full color to show image and color quality. |
| LSI/LSO/LSA | Line Maps: 100% scale of 48" x 48" paper proof in full color to show image and color quality. |
| MP | Mural Panels: 100% scale of 48" x 48" paper proof in full color (or black and white) to show image and color quality. |
| D | Directional Signage: 100% scale paper proofs in full color to show image and color quality. |

0.3 QUALITY ASSURANCE

- A. Reference Standards: The work shall conform to the codes and standards of the following agencies as further cited herein:
 - 1. ADAAG: Americans with Disabilities Act Accessibility Guidelines
 - 2. ANSI: American National Standards Institute.
 - 3. ASTM: American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103 as published in "Compilation of ASTM Standards in Building Codes".
 - 4. MAAB: Massachusetts Architectural Access Board.
- B. Source: For each type of material required for the work of this section, provide primary materials which are the products of one manufacturer.

Provide secondary materials which are acceptable to the manufacturers of the primary materials.

- C. Accessibility: The ADAAG and the MAAB regulations are pertinent to the design and installation of items covered under the work of this Section. When guidelines conflict, the guideline giving greater access shall be applicable.

The approved manufacturer shall have experience in the type of work required and provide samples and specs; shall have a reputation for doing satisfactory work on time; and shall have recently successfully completed similar work.

- D. The Contractor is responsible for the proper engineering of all items. The internal structure, dimensions and specifications for all items shall be indicated in the Contractor's shop drawings. Sign Contractor to engineer signs to proper level to withstand abuses of their environment.
- E. Coordination: The work in this Section shall be completely coordinated with the work of other Sections. Verify dimensions and work of other trades that adjoin materials of this Section before the installation of items herein specified. Cooperate with such trades to assure the steady progress of all work under this Contract.
- F. Quality Requirements for Fiberglass Signage, Maps and Mural Panels:
1. Digital Artwork: Final digital signage artwork to be provided by the MBTA Design Department to the contractor.
 2. Formats: Digital files produced from a graphic program such as Adobe InDesign, Adobe Illustrator, Adobe Photoshop with extensions: AI, EPS, or PDF. Formats are determined by the MBTA Design Department.
 3. Typography: All fonts embedded/outlined within artwork.
 4. Colors: Must match Pantone colors specified in digital files and on drawings.
 5. Resolution Input (quality from the MBTA): Vector files, resolution of 300 – 600 DPI To be matched by output (quality from Fabricator) resolution of 150- 300 LPI
 6. Fabricator must provide their capabilities/specs to the MBTA to show resolution output capability: line screens (LPI).
- G. Fiberglass Time Schedules and Required Proofs/Samples from the Fabricator to the MBTA Design Department:

1. One
Fiberglass Sample to show colors: 3" x 4" Sample to be approved by the MBTA Design Department prior to production of all final paper proofs.

2. Paper
Proofs are produced by the fabricator using only the MBTA Design Department digital files. All paper proofs shall be sent to the MBTA Design Department within 30 business days from MBTA submittal of

digital artwork. Paper proofs of all signs, maps and murals to be 10%, as well as 100% scale (Sizes vary: 6, 12, 18 inches wide x 48 inches, 96 inches, or as required by the MBTA Design Department) paper proofs of selected signs, murals and maps requested by the MBTA Design Department. Approval of all proofs is required from the MBTA Design Department prior to final fabrication.

3. All samples and paper proofs are to be provided to the MBTA Design Department at no extra charge.

H. Warranty:

1. Submit a written Manufacturer's warranty for MBTA acceptance, signed by the manufacturer, agreeing to repair or replace panels that fail during the specified warranty period. Failures include, but are not limited to, the following:

- a. Coating degradation.
 - b. Chipping, chalking, fogging or discoloration.
 - c. Fading.
 - d. Yellowing
 - e. Structural failure.
 - f. Delamination of applied graphics.
 - g. Delaminating or degradation of applied anti-graffiti coatings.
2. Warranty Period: 10 years

0.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store work under this Section in a manner to prevent cracking or stress of components and to prevent mechanical damage or damage by the elements.
- B. Deliver work under this Section to Site in ample time to avoid delay in job progress and at such times as to permit proper coordination of the various parts.
- C. Installation of this work until near time of Substantial Completion.

0.5 PROJECT CONDITIONS

- A. Inspection of Site: The Contractor shall visit the site of the proposed work and fully acquaint himself with existing conditions and fully inform himself as to the facilities involved and the difficulties and restrictions attending the performance of the Contract, prior to submitting his price quotation.

PART 2 - PRODUCTS

0.1 ACCEPTABLE MANUFACTURERS

- A. Fiberglass Sign Manufacturers: Provide products of manufacturers if they meet the requirements of these specifications:

0.2 MATERIALS

- A. Steel:

1. Structural steel materials, details and workmanship shall conform to the specifications of the latest edition of the A.I.S.C. Specifications for the Design, Fabrication, and Erection of Structural Steel Buildings.
2. Steel posts shall be Schedule 40 pipe, 2 inch internal diameter, ASTM A120 Standard Weight. The bottom of each post shall be deformed to provide for anti-rotation.

- B. Aluminum: Alloy 6063-T5, urethane finish.

- C. Plywood: APA Graded, Exterior Grade A-C Plywood and Marine Grade Plywood, as required.

- D. Fiberglass:

1. Cast Fiberglass reproductions shall be a one-piece fiberglass and galvanized steel reinforced polyester resin casting with a minimum wall thickness of 1/4 inch. The casting shall be done with a full-scale urethane rubber mold. The mold shall be taken from a wood and clay pattern - with texture and color to match the surrounding ceramic tile.
2. Fiberglass shall be constructed of low shrink, thermosetting polyester resins, reinforced with a quantity of glass fibers that measures no less than 30 percent by weight, in conformity with industry standards of the Society of Plastics. All fiberglass signs shall exhibit the following physical properties:
 - a. Flexural Strength: 16,000 - 28,000 psi
 - b. Tensile Strength: 9,000 - 18,000 psi
 - c. Compressive Strength: 13,000 - 17,000 psi
 - d. Specific Gravity: 1.4 - 1.6
 - e. Chemical Resistance: will not be affected by mild soaps, detergents, alkalis, oils, carbon tetrachloride or weak acids.
 - f. Temperature Resistance: will remain strong and firm without warping, cracking or distorting at 200°F; below 32°F strength will increase a minimum of 50%.
 - g. Weather Resistance: shall retain surface integrity under all weather conditions of sunlight, rain, snow, sleet, hail and windblown sand or dirt.

3. Art and Imaging
 - a. Supplier shall fabricate final signs as required from original artwork and as indicated in drawings. The images shown on the drawings are "for Position Only" and shall not be used for final artwork. Typographic specifications and color breaks are indicated on the drawings.
 - b. All signage proofs shall be submitted to the MBTA Design Department for review and approval before it is reproduced in fiberglass.
 - c. The quality of the screen image shall be of high resolution with no ragged edges or dots seen on either type or image.
 - d. All color processes and black and white imaging processes shall be in perfect registration and in a resolution between 300 to 600 DPI input, or at 150 to 300 LPI output.
 - e. The line screen (LPI) output from the fabricator shall match or exceed the original graphic dots per inch (DPI) resolution. Accordingly: Minimum 150 LPI for 300 DPI; and Minimum 300 LPI for 600 DPI.
4. Color Matching
 - a. Match all spot colors using the Pantone Matching System (PMS) or as per file designation in the digital files. Color samples and proofs are to be provided to the MBTA Design Department at no extra charge.
 - b. Mural Panels: Final digital artwork for the mural panels will be supplied from the MBTA Design Department to the contractor. The contractor shall be responsible for the fabrication of the artwork according to industry standards of quality and procedures.

E. Hardware:

1. Tamper resistant fasteners to be stainless steel, 3/8" dia. button head Phillips socket pinhead.
2. High strength bolts other than anchor bolts, nuts and washers shall conform to ASTM-A325.
3. Threaded studs shall be low carbon mild steel of a minimum yield strength of 50,000 PSI.
4. All hardware shall be galvanized per ASTM-A153 requirements.
5. Where mechanical fasteners and hardware are required, they shall be of adequate thickness, length and construction to properly secure the sign/mural unit. Any visible portion of any mounting device shall be finished to match adjacent sign surface, unless otherwise specified.
6. Metal fasteners and hardware in contact with dissimilar metals shall have a protective coating or neoprene shields to prevent electrolytic action.

F. Adhesives:

1. Where adhesive mounting techniques are specified, the Contractor shall use adhesives specifically designed for compatibility with the base materials and the desired adhesive strength. All adhesives shall be tested on site. All adhesives shall be indicated in the shop drawings.
2. Surfaces on which signage is to be installed using adhesive shall be free of grease, oil, or any other residue.
3. Foam tape shall be 1/32" thick, high density open cell double coated polyurethane foam tape.
4. Very high bond (VHB) tape shall be double coated acrylic foam tape.
5. Provide necessary amounts of clear silicone sealant or grout for use in pin mounting.

0.3 FABRICATION

- A. Fabricate work to be truly straight, plumb, level and square with smooth flat surfaces and sharp corners, except where indicated otherwise.
- B. Precisely form work to sizes, shapes, and profiles indicated on approved shop drawings.
- C. Fabricate work with uniform joints that are not visible.

PART 3 - EXECUTION

0.1 INSPECTION

- A. The Installer shall examine substrates, supports, and conditions under which this work is to be performed and notify the Contractor and the MBTA Design Department, in writing, of conditions detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected. Beginning work means Installer accepts substrates and conditions.
- B. Notification Point - MBTA Design Department will be given 72 hour notice to perform field inspection at the start of installation of signage. If work does not meet project requirements, contractor must remove and replace deficient work

0.2 INSTALLATION

- A. All existing or new frames and locations where signs are to be installed must be field measured by contractor. This must be documented and sent to the Design Dept. prior to final digital artwork submittal and fabrication of signage

- B. Strictly comply with approved shop drawings and manufacturer's instructions and recommendations, except where more restrictive requirements are specified in this Section.
- C. Install work plumb, level, in true plane and alignment. Provide signs and graphics where shown or scheduled using mounting methods indicated.
- D. Protect adjacent or adjoining surfaces and work from damage during installation in this Section.
- E. Work shall be designed and anchored so that work will not be distorted nor the fasteners overstressed from expansion and contraction of metal or other materials as applicable.

0.3 TOLERANCES

- A. The following allowable installed tolerances are allowable variations from locations and dimensions indicated by the Contract Document and shall not be added to allowable tolerances indicated for other work:
 - 1. Allowable Variation from True Plumb, Level and Line: Plus or minus 1/16 inch from true position for signage smaller than 24 by 24 inches in size; plus or minus 1/8 inch from true position for signage 24 by 24 inches in size and larger.
 - 2. Allowable Variation from True Plane of Adjacent Surfaces: Plus or minus 1/16 inch.

0.4 CLEANING AND PROTECTION

- A. Adjust work to present the best possible appearance. Touch-up damaged finishes and repair damage to eliminate evidence of repair. Clean exposed surfaces using materials and methods recommended by manufacturer of material or product being cleaned. Remove and replace work that cannot be successfully repaired or cleaned.
- B. Provide temporary protection to ensure work being without damage or deterioration at time of final acceptance. Remove protections and re-clean as necessary immediately before final acceptance.
- C. Manufacturer shall provide Authority with information on cleaning and maintenance recommendations for all signs.
- D. Names, stamps and decals of manufacturers, installers or maintainers of signs shall not be visible in the finished work.

END OF SECTION